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Natural Sciences and Engineering Research Council of Canada

NSERC Contact

Investing in people, discovery and innovation

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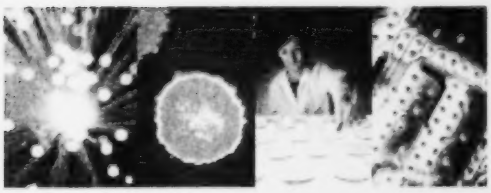

A Vision for NSERC in the 21st Century

Editorial by NSERC President Tom Brzustowski

At its meeting in June 2003, Council unanimously endorsed a new vision for NSERC that will see us expanding into new fields and improving the delivery of our traditional services.

The Vision

NSERC invests in people, discovery and innovation through programs that support university research in the natural sciences and engineering on the basis of national competitions, and *that will continue to be our major activity. But in addition*, NSERC will develop programs to meet important needs in math and science education, in research and in innovation. Because these needs are different in different parts of Canada, we also will develop a local presence in the regions of Canada.

The Philosophy

Two main elements shape our vision.

The first is that there are emerging problems in the math and science education of young people, in supporting discovery and in innovation. Solving these problems is necessary if Canadians are to rank among world leaders in the discovery of new knowledge and if Canada is to keep its place among the most prosperous of the world's nations. We have studied these issues and we feel both obliged and ready to act by launching small-scale pilot programs designed to address them. To be credible, we believe we must start to do this within our existing resources, but we also believe that when these pilots begin to meet the needs effectively, more resources will be entrusted to us to expand the scale of our efforts. We will work hard to keep the local public informed of what we do to earn their support for our work.

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NSERC is Canada's instrument for promoting and supporting university research in the natural sciences and engineering, other than the health sciences.

NSERC supports both basic university research through discovery grants and project research through partnerships among universities, governments and the private sector, as well as the advanced training of highly qualified people.

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Secondly, NSERC remains committed to excellence as the dominant criterion and to peer review as the principal mechanism of quality control in our funding decisions. However, we believe that the excellence must always be measured and peer review conducted in ways that are appropriate to the activity we undertake and to the community we are working with.

The Actions

In addition to what NSERC is doing now, we will help to meet Canada's needs in the following areas:

- *Science and Math education:* There is widespread and growing recognition that science literacy and numeracy are vital skills in the modern economy, but there is also much dissatisfaction with the quality of science and math education in Canadian schools. Even though NSERC is a federal agency, we have learned that we can do much to improve the quality of the early preparation of Canadian children in these two foundation subjects in ways that will assist the provinces in their area of responsibility. We can, in partnership with many others who share our concern, help in developing and improving the skills and resources available to science and math teachers.
- *Regional capacity building in research:* NSERC has studied the needs of universities in Atlantic Canada and the Prairies, and of smaller institutions everywhere in Canada, to build research capacity. Other programs do not directly address this issue. NSERC has worked with the universities; we know what is wanted and the universities agree. Therefore we will design a program to assist in building up research capacity in universities where it is lacking. It will be a success if, in a few years, these institutions have the capacity to succeed much better than they do now in the national competitions for research support.
- *Colleges helping innovation at the community level:* Community colleges are a valuable knowledge resource in hundreds of communities across Canada. We have worked with the colleges to find out what they need to be more helpful to local SMEs in R&D and innovation. Because the colleges tell us we understand their potential and their needs, and know how to address them correctly, we are in a position to design a program to enable the colleges to play a bigger role in supporting innovation at the community level.
- *A national framework for "Big Science":* Canada has no policy or consistent process for making decisions on "Big Science" projects; but a policy and process are badly needed in light of the large number of competing worthy proposals for expensive science projects. Such projects, apart from their scientific merit, may have major implications for the local economy, and attract local political support. To meet the needs of decision making, NSERC is working with the National Research Council to develop a framework for assessing and ranking "Big Science" proposals. We will develop this framework, validate it by applying it in hindsight to previously funded major projects, and make it widely available as a tool both for applicants in the research community and for decision makers in government.
- *Regional presence for NSERC:* Many of the new things we intend to do, in these new initiatives and in our current programs as well, would benefit greatly from NSERC staff being closer to the institutions and their local communities. We will also listen better if we're close. Therefore, NSERC

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NSERC-Funded Handbook Helps Women "Work Smart"

Becoming Leaders: A Handbook for Woman in Science, Engineering and Technology is a unique source of "smart" information to help women achieve satisfying careers in science, engineering and technology.

Published by the NSERC/Petro-Canada Chair for Women in Science and Engineering, the 142-page, spiral-bound handbook combines important research results with practical tips from women who enjoy successful careers.

Women at all stages in their career will benefit from the book, with topics ranging from preparing for an interview, to achieving work-life balance, planning an academic career, or developing personal networks and mentors. There are sections as well for deans and managers seeking to enhance gender diversity in their organizations.

The book was written by Dr. F. Mary Williams, former NSERC/Petro-Canada Chair for Women in Science and Engineering for the Atlantic region, and Carolyn J. Emerson, who enjoyed a 25-year research career.

"We are delighted with the overwhelmingly positive feedback from individuals and organizations around the world who have found the book so valuable. The book is now in its third printing," said co-author Carolyn Emerson.

Copies of the book are available for $15 plus GST.

"Becoming Leaders" information and order form can be obtained from http://www3.nf.sympatico.ca/carolyn.emerson/, or e-mail carolyn.emerson@earthlink.net.

Dr. F. Mary Williams and Carolyn J. Emerson

University Relations, Memorial University

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intends to open small regional offices. These offices will have the staff and budgets to enable them to make decisions and to take prompt local action. We expect that eventually NSERC will have small offices in the five main regions of Canada: Atlantic Canada, Québec, Ontario, the Prairies, and British Columbia.

- *Public recognition:* The public must be able to recognize what NSERC is and what NSERC does if we are to win their support for our work. Unfortunately, our name is long and complicated, and easily confused. To improve on this, we want to do business under a new label. An attractive possibility is "Science and Engineering Canada." The legal name of NSERC will not change and will appear in all our publications, but we will give prominence to the new label when communicating with the public. We will seek to protect the new label and to obtain permission from Treasury Board to use it.

We believe that all of these new initiatives fit within the mandate given us in the *Natural Sciences and Engineering Research Council Act* 1976-77, namely "(a) to promote and assist research in the natural sciences and engineering, other than the health sciences; and (b) advise the Minister…" There is no need to change the Act.

We will begin planning for the pilots of all the new initiatives immediately, building on work already done. Expenditures in 2003-04 are likely to be small, probably less than $1 million, but we will plan for a total of up to $10 million in 2004-05. That is the limit of what we can squeeze out of our current budget, and we can do that for only a short time. However, I believe that this might be enough to demonstrate success and to attract new resources to expand these programs to a significant scale.

I am very excited by the new vision, thrilled by the unanimous support it received from Council, and gratified at the uniformly enthusiastic response I have been getting from those whom I have briefed on it. I believe that it will prove important for Canada to have NSERC expand its activities in these ways. I also believe that, as a result, NSERC will be stronger and better able to meet the needs of all whom we serve.

Industrial Research Chair Gets Concrete Results

Talk about making concrete plans! Université de Sherbrooke civil engineering professor Dr. Brahim Benmokrane is working with government and industrial research partners to solve the very expensive and pervasive problem of Canada's crumbling bridges.

Steel-reinforced concrete, used for decades to build everything from ports to parking garages, is an imperfect material. Extreme temperatures, road salt, humidity and traffic exert a heavy toll in the form of corrosion and cracks, leading to frequent and costly repairs.

Dr. Benmokrane, who holds the NSERC Industrial Research Chair in Fibre Reinforced Polymer Composite Reinforcement for Concrete Infrastructures, has an innovative solution: replace the rusty steel reinforcing rods with more durable fibre reinforced polymer (FRP) rebars.

FRP consists of synthetic or organic fibres, such as carbon or glass, embedded in resin. These high-tech rebars look similar to steel ones, but are two to six times stronger, weigh only one-fifth as much, and don't corrode, even in extreme conditions. Tiny fibre-optic sensors integrated in the FRP rebars continuously collect data on the structure's performance, which lets Dr. Benmokrane and his team monitor the project online.

Although he uses FRP in a variety of concrete structures, Dr. Benmokrane has focused his pioneering research on bridges, because the cost of repairs and traffic disruptions caused by the deterioration of concrete bridge decks is a major problem. Dr. Benmokrane started with Sherbrooke's Joffre bridge in 1997, which serves as a showcase of FRP's potential, and has since worked on several other bridges in Canada and the United States.

Dr. Brahim Benmokrane

"Bridges are very important for the economy," notes Dr. Benmokrane. "Using FRP instead of steel rebars to construct and repair all these bridges will translate into huge savings because, even though they are initially more expensive, structures built with FRP rebars are expected to last 75 years or more, compared to 20 years for steel."

Dr. Benmokrane says that holding the NSERC Industrial Research Chair gives him the means to continue improving the FRP technology and lowering its cost. His Chair is supported by NSERC, the federal and Québec governments, and industrial partners ADS Composites/ Pultrall Inc., Roctest Ltd., Le Groupe Teknika, GéoLab inc., Les Coffrages Carmel inc. and Hughes Brothers Inc.

He's especially proud that he has been able to help these partners "to develop their products, to improve them in terms of mechanical properties and in terms of durability, and to investigate the structural behaviour."

"Now all these products are being used in the market," he adds.

And that market is growing, thanks in part to updated highway, bridge and building codes that have given FRP their seal of approval. "Most engineers are very, very conservative — they don't want to use new technology without any code," he says. "But now the use is going up."

For his part, Dr. Benmokrane actively promotes FRP technology by conducting seminars across the country. "To use this new material, we cannot rely only on our testing in the lab and our field applications or codes," he says. "We also need to do some professional education, to organize courses and seminars, and to give the information and the knowledge to engineers — how to design with this material and how to use it."

Dr. Benmokrane was born in Algeria and studied in Switzerland before coming to Canada in 1982, to pursue graduate studies. He only planned to stay a couple of years, but the research opportunities here persuaded him to make Canada his home.

NSERC began funding his work in 1987, and he credits that support for allowing him to become a pioneer in his field and launching him on a career path that has culminated with the Industrial Research Chair.

"It's really the best thing a researcher can have," he says of holding an Industrial Research Chair, because it has let him put together a strong team of researchers, and it serves as an important training ground for the graduate students who will become the next generation of innovators.

"Plus," he says, "it gives us an enormous amount of visibility. But credibility — we provide that with our work."

NSERC-IRAP Deal Helps Researchers and Businesses Link Up

Through its Research Partnerships programs, NSERC has teamed up with the National Research Council's Industrial Research Assistance Program (IRAP) to offer funding opportunities to Canadian researchers and small and medium-sized enterprises (SMEs) for joint projects both internationally and at home. These research partnerships will help SMEs draw on Canadian university expertise to compete successfully.

Canadian researchers and their industrial partners can request support for travel and networking costs for International Exploratory Visits specifically targeted at establishing international R&D collaborations. NSERC and IRAP will also share the funding for International R&D Projects with a Canadian SME; the European Union Sixth Framework Program, for example, requires both the Canadian academic and industrial participants to cover their own research costs. Projects within Canada involving university researchers and SME's may also qualify for joint NSERC-IRAP funding.

In each initiative, NSERC will contribute towards the costs of the academic partners and IRAP will contribute towards the costs of industrial participants. Companies must also contribute to project costs from their own resources. Prospective researchers and their industrial partners should contact NSERC and IRAP respectively for guidance in preparing their application.

For more information on the NSERC component, contact Guy Drapeau at (613) 996-2145 or at guy.drapeau@nserc.ca.

For more information on IRAP's SME international elements, contact Denys Cooper at (613) 993-7620 or at denys.cooper@nrc-cnrc.gc.ca; for SME domestic elements, contact Steve Palmer at (613) 993-3996 or at steve.palmer@nrc-cnrc.gc.ca.

Tech Transfer Help

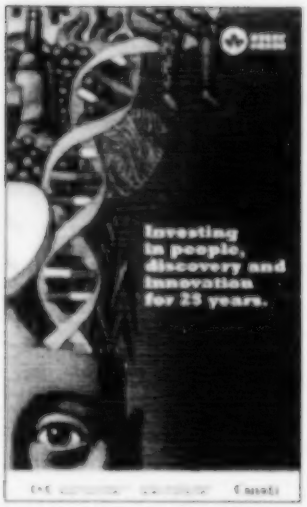
The program guidelines and application forms for the Idea to Innovation Program (introduced earlier this year as the Principle to Product Program) are now available online:

www.nserc.gc.ca/forms/instructions/101/inno/e.asp

www.nserc.gc.ca/forms/formtable_e.htm.

The "Idea to Innovation" program provides funds to university researchers for R&D activities leading to the transfer of technology to a new or established Canadian company. For more information, please contact your ILO office or Guy Drapeau at guy.drapeau@nserc.ca.

Do You Have Your Copy?



To celebrate our 25th Anniversary, we've produced an eye-catching brochure and poster to highlight some of the achievements of our researchers. You may have seen them in NSERC exhibits, displays and information packages. If you want your own (the posters look great on the wall and the brochures are a ready source of quick facts about NSERC that you can pass on to your visitors), you can request copies from our Distribution Centre by e-mail at distribution@nserc.ca.

Council Heads East

NSERC's Council is having two "out-of-Ottawa" experiences this year.

In early June, Council's two-day meeting took place in Saint-Hubert, Québec, at the Canadian Space Agency, and was hosted by Canadian astronaut Julie Payette, a Council Member.

In late October, Council will meet in Halifax at Dalhousie University. In addition to dealing with Council business, members will tour labs, and meet students and faculty.

"I feel meeting researchers in every part of the country and finding out what they think is essential to our job," said Council Vice-President Joanne Keselman. "If we always met in Ottawa, that wouldn't be possible."

Council meets three times a year, at least once outside Ottawa. In 2004, Council will meet at the University of Northern British Columbia at the invitation of Council Member Max Blouw, Vice-President (Research) at UNBC.

In July, Allan Rock, Minister of Industry and Minister responsible for NSERC, announced the appointment of Dr. Pierre Coulombe to NSERC's Council for a term of three years. Dr. Coulombe is a consultant in business strategy and finance and has experience in the management of public and private sector enterprises.

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Watch for it

eBusiness is on track to release the production version of the new Financial Data Submission and Reconciliation Service by the end of the calendar year.

"This service will lighten the load for the community," said Daniel Gosselin, Director of NSERC's Finance Division. "It's happening because universities told us that they needed the service, and the universities participating in the recent pilot provided the information and feedback to make it a success."

FDSR Project Manager Daniel Lefebvre was instrumental in keeping the community's perspective front and centre. He managed all the consultations and early development of the prototype. Now, with Daniel's secondment to NSERC ending (he returns this fall to his regular position as Assistant Director of Grants and Administration at the University of Ottawa), the torch passes to eBusiness colleague Marc Roy. Marc recently joined the eBusiness team with four years of experience in NSERC's Finance Division and a sound appreciation of the challenges faced by grantees and adminstrators. Daniel's presence at NSERC will be greatly missed but we look forward to a continuing relationship with him as a client.

eSubmission. What a Difference a Year Makes.

The massive power blackout in mid-Aug. couldn't stem the flood of Form 180s arriving at our servers. Last year only 20 per cent of all submissions arrived via this route; this year, the figure was a healthy 80 per cent!

Here to Help!

As competition season gets underway, please keep our contact information handy. We welcome questions and feedback; we're ready to help in any way we can.

To schedule a consultation with an eBusiness Project Manager, send an e-mail to webapp@nserc.ca or call (613) 943-7983. The Helpdesk phone number remains (613) 995-4273 and while its regular hours of operation are Monday to Friday, 8 a.m. – 5 p.m. Eastern Daylight Time, it is open from 8 a.m. to 8 p.m. during the peak period (Sept. 2 to Oct. 31.)

Grad Students and Postdocs Get Bigger Stipends

NSERC has increased the value of its stipends to graduate students and postdoctoral fellows. These increases were made possible by the additional funding provided to NSERC in the February 2003 federal budget and demonstrate the priority that Council places on support of the training of new researchers.

- The Industrial Postgraduate Scholarship stipend was increased from $13,800 to $15,000. The required industrial contribution will increase from $5,500 to $6,000 as of next May 1.
- The doctoral-level postgraduate scholarship (PGS Doctoral, formerly PGS B) was increased by $1,900, to $21,000 per year.
- The Postdoctoral Fellowship was increased from $35,000 per year to $40,000 per year.

Council has also increased the amount that a professor can pay as a salary contribution or stipend to a doctoral student from an NSERC grant. The new maximum is $19,000 per student per year, a $2,500 raise from the previous level. This amount does not include non-discretionary benefits.

Research Ethics Web Site Launched

The Interagency Advisory Panel on Research Ethics (PRE) launched its new Web site, www.pre.ethics.gc.ca, this summer. The site, designed to help people conducting, participating in, or reviewing research that involves humans, offers extensive information about PRE, its mandate, initiatives, meetings, and publications, as well as the official version of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS). Updates to the TCPS are available individually, and users can "subscribe" to receive future ones.

A section dedicated to "Public Participation" details how the research community and the public can become involved in advancing research ethics standards and practices in Canada. An extensive "Links" page connects users to national and international research ethics documentation and organizations.

More information and new features to enhance site interactivity are being developed. Later this fall, an "On-line Tutorial" to facilitate the use, interpretation and implementation of the TCPS in the research community will also be available.

The Interagency Panel's mandate is to promote high ethical standards and oversee the development of the TCPS, which the three agencies have jointly agreed to uphold and enforce.

Arctic Research Takes a Great Leap Forward...Ship and New NCE Launched

On August 26, the federal government returned to Québec City for a triple-barrelled announcement of good news for research in Canada's Arctic.

Tied up in the port was an icebreaker newly refitted by the Canada Foundation for Innovation (CFI) and the Canadian Coast Guard as a state-of-the-art research vessel. On shore was Robert G. Thibault, Minister of Fisheries and Oceans, who with representatives from the CFI watched with great pleasure as Mrs. Lily Schreyer baptized the ship the *CCGS Amundsen*, after the famous Norwegian Explorer and first navigator of the Northwest Passage.

The event also signalled the imminent departure of the NSERC-funded team of the CASES Research Network. Eager to repeat Amundsen's experience, the team sailed from Québec City on Sept. 13 to spend this winter studying environmental change in the Beaufort Sea.

The best news, however, was reserved for Hélène Scherrer, Member of Parliament for Louis-Hébert. Speaking on behalf of Industry Minister Allan Rock, she announced $25.7 million in funding to create ArcticNet, Canada's newest Network of Centres of Excellence (NCE).

Paul Dionne, Fisheries and Oceans Canada

Université Laval biology professor Dr. Louis Fortier, who also leads the NSERC CASES project, was introduced as ArcticNet's first scientific director. He will oversee a major research program involving more than 145 researchers from the natural, social and medical sciences in 41 Canadian and foreign universities.

Twenty-seven government agencies, departments and public sector supporters and two industrial partners will participate in the projects which will look at the environmental and socio-economic consequences of warming across large regions of the Canadian Arctic. For more information about ArcticNet and the NCE program, visit www.nce.gc.ca/index.htm.

Northern Research Initiatives

Two new initiatives designed to make research in the North easier will be launched this fall. They were made possible by additional funds provided in the February 2003 budget. Northern Research Internships will ultimately allow up to 30 postgraduate students per year to spend extended time conducting research in the North in partnership with northern organizations or communities, and Northern Research Supplements will provide supplements of up to $10,000 to the Discovery Grant of some researchers working in the North.

These efforts are part of an overall plan by NSERC to rebuild Canada's role in northern research. They and previously announced initiatives, Northern Research Chairs and Postgraduate and Postdoctoral Northern Supplements, were recommended by a Task Force set up by NSERC and the Social Sciences and Humanities Research Council in 1998.

Details on how to apply for the new initiatives will be posted on NSERC's Web site this fall.

NSERC and CIHR Jointly Fund Collaborative Health Research

NSERC and the Canadian Institutes of Health Research (CIHR) have signed a five-year agreement to expand the Collaborative Health Research Projects (CHRP) program. NSERC started the program in 1999 to promote interdisciplinary research and accelerate the transfer of knowledge from the natural sciences and engineering research community into applications that will benefit the health of Canadians.

The new agreement will provide more funding and greatly increase opportunities for novel collaborations between the NSERC and CIHR researchers. More than $6 million in funding over three years will be available in the next competition. The application deadline was Oct. 1, and the results will be announced next April.

For more details, refer to the Program Guide for Professors on NSERC's Web site at www.nserc.gc.ca/professors_e.asp?nav=profnav&lbi=toc_a.

Newsbureau Working for You

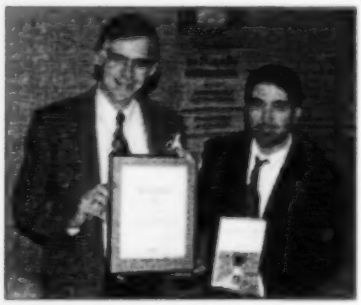
During a visit to the University of British Columbia in April, we alerted its campus publication, *UBC Reports*, to Dr. Lee Groat's research into gemstones in the Yukon. Their June 5 feature on Dr. Groat was but a hint of things to come. On August 28, a piece by Margaret Munro appeared in *The Ottawa Citizen*, *The Province* (Vancouver), *The Herald* (Calgary), *The Journal* (Edmonton), the *Times Colonist* (Victoria), and the *Leader-Post* (Regina) about his discovery of what appears to be a new, blue gemstone that may be a Canadian version of the extremely rare Brazilian maxixe (pr. mashi-shé). The story ran in several other national media thereafter.

We promoted Ryerson University's Dr. Kathryn Woodcock's research into carnival ride safety. The story was covered by *The Globe and Mail* on June 26, CBC Radio on the 28th, *La Presse* on July 23, and *The Toronto Star* on August 25.

Our story about University of Guelph researcher Dr. Medhat Moussa's work on an intelligent, voice-responsive robotic hand made its way into *The Guelph Mercury* on August 6, and on the following day it was featured in *The Globe and Mail*, *The Kitchener-Waterloo Record*, and CBC Radio's *Metro News*.

Discovery Channel's *Daily Planet* also featured the University of Sakatchewan's Dr. Jack Gray's use of virtual reality with insects (April 2); and Dr. Drew Rendall's research into hearing and visualization (April 10) at the University of Lethbridge.

On June 25, *The Globe and Mail* wrote up UBC's Dr. Rizhi Wang's work on coatings for hip implants and followed up on July 5 with another NSERC-promoted story, this time about Dr. Thomas Stachel of the University of Alberta whose research involves the crushing of diamonds.



At the Canadian Science Writers' Association (CSWA) meeting in Saskatoon in June, Arnot Sheppard (left), Manager of the NSERC Newsbureau, presented a Science in Society Journalism Award to Dan Falk for his book *Universe on a T-Shirt: The Quest for the Theory of Everything*.

Among the presenters at the CSWA meeting was Jamie Bastedo, who won a 2002 Michael Smith Award from NSERC for his imaginative promotion of science to audiences of all ages in the Northwest Territories and beyond. NSERC took advantage of his presence there to formally present his award to him. He is pictured here with University of Saskatchewan professor and NSERC Rep Dr. Louise Nelson.

Wise Use of Unspent Research Dollars

Every year, NSERC reviews large unspent grant balances to make sure that the release of funds to researchers matches as closely as practicable the actual cash flow requirements.

This past February, NSERC contacted approximately 380 grantees and gave them the option of justifying the immediate need for their 2003 instalment or requesting a deferral. Approximately one third chose the deferral option and this translated into $3.2 million that will now be used for urgent expenditures.

For information on deferring your next instalment, send an e-mail to our Award Administration section: cssdfin@nserc.ca.

"I'd like to thank the universities and researchers who were involved in the 2003 Residual Funds project. Their time and effort are greatly appreciated," said Daniel Gosselin, NSERC's Director of Finance.

Universities' PR Efforts Get a Boost from NSERC

At the annual meeting of the Canadian Council for the Advancement of Education in London in June, delegates from universities across Canada learned about the good publicity NSERC is generating for them.

"Our approach to publicity has always been to put the emphasis on the work of individual researchers, rather than on NSERC; and since the ads we run and the stories we pitch to the media always prominently mention the researcher's university, this publicity has been good for the universities too," said NSERC Communications Director Tim Nau.

In his talk, Mr. Nau told the delegates that NSERC national advertising in the 18 months prior to the meeting featured research carried on in 12 universities. In addition, NSERC leaflets and brochures included write-ups on research in 23 universities, and NSERC marketed stories about research in 24 universities to the media.

"In these and other ways we put the spotlight on 47 different universities in all ten provinces," he said. "We were also instrumental in bringing eight prominent university researchers to Ottawa to address members of parliament. The communications staff in each university do fantastic work in showing the public how important universities and university research are. I hope what we're doing extends their reach a little."